

# A new species of *Nemestheria* (Crustacea, Conchostraca) from the Aioi Group (Cretaceous) of Okayama, Japan

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**Abstract.** *Nemestheria aidaensis* sp. nov. represents the first appearance in Japan of this genus, which is considered as the leading form of conchostracan fossils in nonmarine Cenomanian deposits and has a wide distribution. This new species is very similar to *Nemestheria lineata* Chang and Chen and *Nemestheria robusta* Zhang and Chen collected from the Qingshankou Formation of NE China. The results of both palaeontological researching and Fission-Track dating have shown that the Tsurukame Upper Formation of the Aioi Group might be Cenomanian in age.

**Key words:** Aioi Group, Cenomanian, conchostracans, Okayama

## Introduction

The genus *Nemestheria* was established within the family Bairdetheriidae Novojilov by Chang and Chen (1964) based on the type species *N. lineata* Chang and Chen from the Cenomanian Qingshankou Formation of NE China. It has been also found in the Red Branch Member of the Woodbine Formation of Northern Texas (Stephenson, 1952; Zhang *et al.*, 1976); the Matoushan Formation of Central Yunnan of China (Chen, 1977); the Chaochuan Formation of Zhejiang, the Hekou Formation of Fujian and the Huizhou Formation of southern Anhui Provinces of southern China (Chen and Shen, 1982); the Kukebai Formation of Kashgal, Xinjiang Uigur Autonomous Region, northern China (Li and Chen, 1992).

This paper reports a new species of *Nemestheria* from a black shale of the Kagami Member of the Tsurukame Upper Formation, Cretaceous Aioi Group (Igi and Wadatsumi, 1980) near Nakaiso of Aida Town, Okayama Prefecture, Southwest Japan (Figures 1 and 2). The conchostracans-bearing volcano-sedimentary series of Hyogo Prefecture has been referred to as the Sasayama Group, correlated generally to the Inkstone Group of the Hiroshima or Okayama area, or the Kanmon Group of Kitakyushu area, as early Cretaceous rocks (Matsuura and Yoshikawa, 1992). According to the carapace and ornamentation of growth bands, the conchostracan fossils collected from Sasayama Town, Taki County, Hyogo of Japan (Kusumi, 1960) are similar to those from the Inakura Formation near Yamaji village of Ibara City, Okayama, and probably belong to the yanjiestherids (Chen, 1996, pl. 1, figs. 1–8; pl. 2, figs. 1–2). The specimens described in the present paper, however, differ from them in having a smaller carapace, strong and stout growth lines with a median groove, and both long and short radial lirae in the growth bands. All of them show the characteristics of *Nemestheria*. The occurrence of *Nemestheria* indicates

that the Kagami Member of the Tsurukame Upper Formation might probably be Cenomanian in age. This estimation of the age of the member seems to be conformable to the age of the Takitani Member overlying the Kagami Member by fission-track dating (Masumoto and Wadatsumi, 1983).

## Systematic description

Family Jilinstheriidae Zhang and Chen, 1976

*Remarks.*—Carapace valve elliptic, rectangular, oval or subcircular in outline; growth lines stout and strong; intervals (growth bands) broad and few in number, ornamented with various complex striae and lattice-work all developing from the simple radial striae; these complex sculptures of lineal arrangement in the posterior or postero-vental part of valve.

*It includes.*—*Nemestheria* Chang and Chen, 1964, *Jilinstheria* Zhang and Chen, 1976, *Plestheria* Zhang and Chen, 1976 and *Dictyestheria* Chang and Chen, 1964.

*Geologic age.*—Cretaceous.

Genus *Nemestheria* Chang and Chen, 1964

*Type species.*—*Nemestheria lineata* Chang and Chen, 1964 from Cenomanian Qingshankou Formation at Huaide of Jilin Province, NE China.

*Diagnosis.*—Carapace valve of small to moderate size; oval, elongately elliptic, circular or subquadrate in outline; umbo anterior or subcentral; long and radial striae intercalated with short lirae in the growth bands; the short lirae only in the lower half of each interval, missing near the umbo (Chang and Chen, 1964).

*Distribution.*—East Asia and Northern America; Cenomanian.



Figure 1. Distribution of the Cretaceous to Paleogene rhyolitic to dacitic volcanic rocks in Inner Southwest Japan. Locality of Figure 2 and the place and data of the fission-track dating (Masumoto and Wadatsumi, 1983) are also shown.

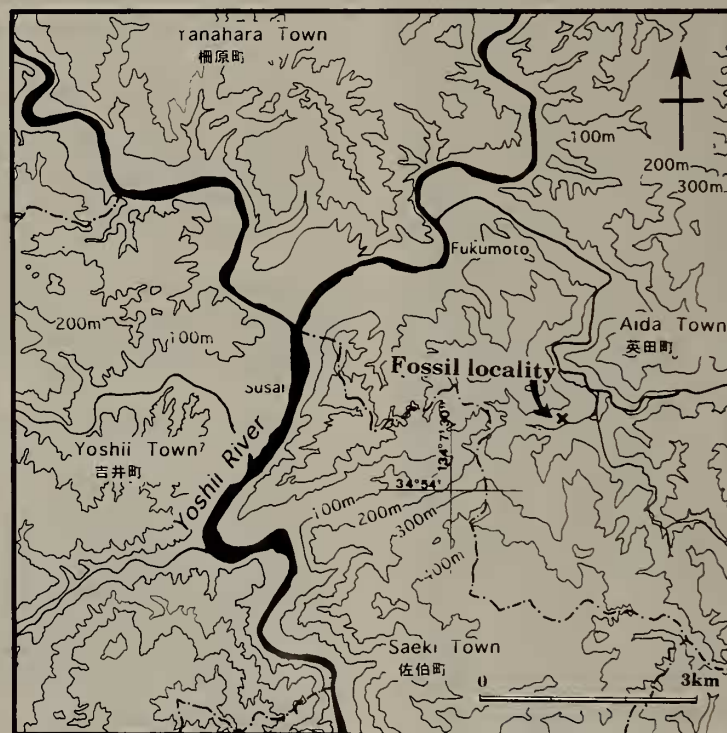
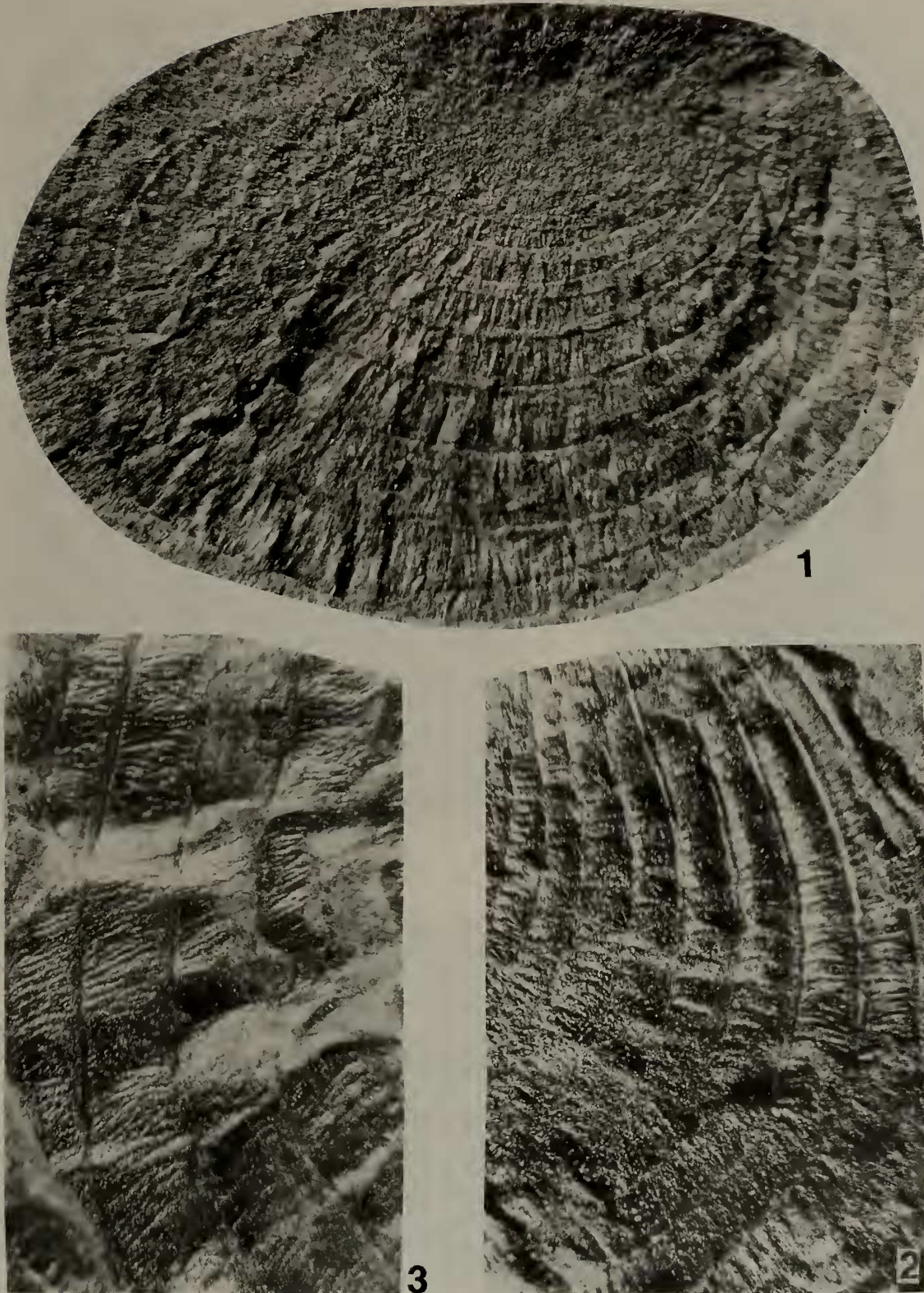


Figure 2. Map of the Aida area, Okayama Prefecture, showing the fossil locality.





**Figure 3.** *Nemestheria aidaensis* Chen and Suzuki sp. nov. 1. external mould of left valve,  $\times 40$ , A10A.T.; cat. no. 128937. 2. fragment of right valve,  $\times 40$ , A10A.T.; cat. no. 128938. 3. sculpture of growth bands near the postero-ventral margin of the holotype,  $\times 40$ , A10A.T.; cat. no. 128939.

*Nemestheria aidaensis* sp. nov.

Figures 3-1-3; 4-1-5

*Diagnosis.*—A *Nemestheria* species having shorter elliptic outline of carapace valve and broadly curved ventral margin.

*Materials.*—Only one sample with about 70 carapace valves. It was collected from a black shale of the Kagami Member of the Tsurukame Upper Formation, the Aioi Group in southwestern Aida Town of Okayama Prefecture, Southwest Japan. Holotype: right valve cat. no. 128939. All specimens utilized here are housed in the Nanjing Institute of Geology and Palaeontology.

*Description.*—Carapace small to medium in size, elliptical to subcircular in outline, 3.5–8.0 mm long, 2.1–5.4 mm high. Dorsal margin broken with umbo between its center and anterior end. Anterior and posterior margins rounded, ventral margin broadly curved downward. 13–20 stout growth lines with median grooves. Long and radial striae intercalated with 1–2 short lirae in growth bands; the short lirae only in the lower half of each interval, missing near umbo (Figures 3-1–2; Figures 4-5) or expanding as long as radial striae near ventral margin (Figures 3-3).

*Remarks.*—The new species closely resembles *N. lineata* Chang and Chen and *N. robusta* Zhang and Chen from the Qingshankou Formation of the Songliao Basin in NE China, but it differs from the former in having shorter elliptic outline of the carapace valve and from the latter in having a broadly curved ventral margin.

*Locality and horizon.*—Southwestern Aida Town of Okayama Prefecture, Southwest Japan; Kagami Member of the Tsurukame Upper Formation (Cenomanian age), Cretaceous Aioi Group.

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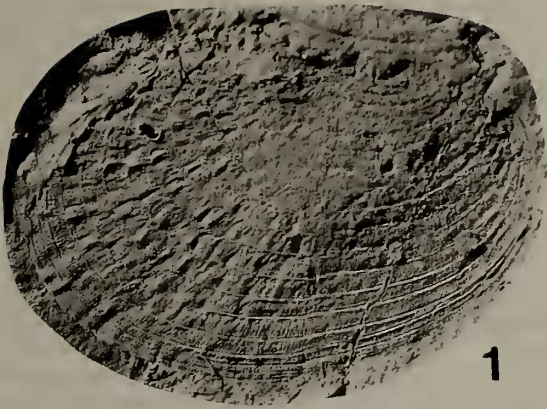
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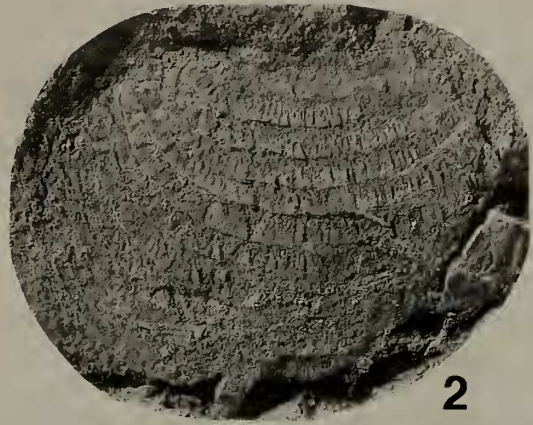
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**Figure 4.** *Nemestheria aidaensis* Chen and Suzuki sp. nov. 1. holotype, right valve,  $\times 8.5$ , A10A.T.; cat. no. 128939. 2. broken right valve,  $\times 8.5$ , A10A.T.; cat. no. 128940. 3. sculpture of growth bands in upper half of valve,  $\times 40$ , A10A.T.; cat. no. 128940. 4. opening two valves,  $\times 8.5$ , A10A.T.; cat. no. 128941. 5. sculpture of growth bands,  $\times 40$ , A10A.T.; cat. no. 128941.





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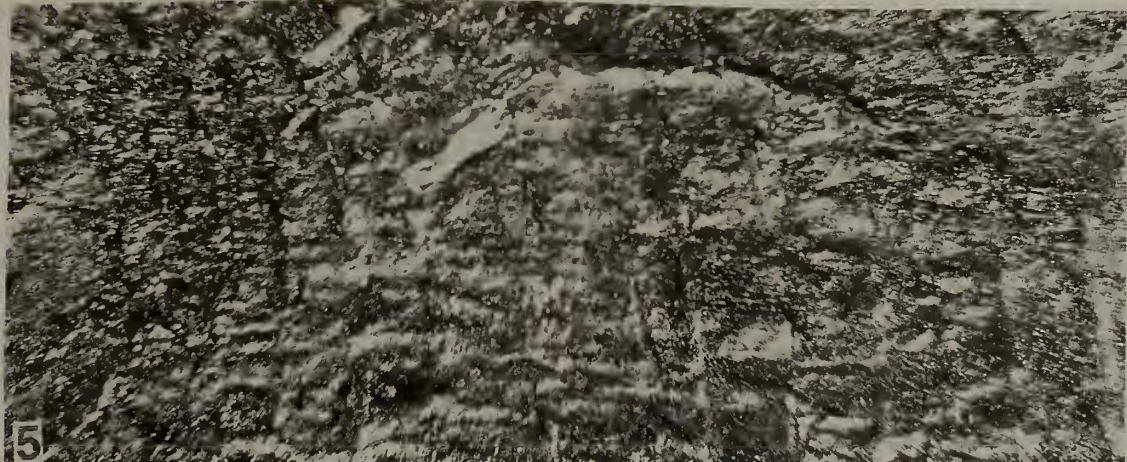
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